Economics Information

Ontario

APPLE PRODUCTION COSTS FOR STANDARD AND SIZE-CONTROLLING TREES, ONTARIO, 1982

ECONOMICS BRANCH

ONTARIO MINISTRY OF AGRICULTURE AND FOOD
LEGISLATIVE BUILDINGS, TORONTO, ONTARIO, M7A 1B6

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THE APPLE INDUSTRY IN ONTARIO

Apples are Ontario's major fruit crop, with sales of the 1981 crop surpassing $36,000,000 and ranking third to potatoes and processing tomatoes in Ontario's fruit and vegetable industry. Marketed production in the 1977-1981 period rose nearly 19 percent from the 1972-1976 period. The 1972-1976 period had shown a slight decrease from the previous five-year period. The 1980 crop of 377.7 million pounds was the largest on record while the 1981 crop was the smallest since 1973 due to extremes of winter weather conditions. The 1982 crop showed a considerable increase over 1981 and equaled the five-year average (Table 1).

Acreage of apples has changed very little in Ontario over the last fifteen years but the type of tree being grown has changed dramatically. The number of trees growing on size-controlling rootstock has been

Table 1.—Apple Acreage, Production, and Farm Value in Ontario, 1967-1982

Year	Acres	Marketed production	Farm value
	no.	'000 lb.	$'000
1982	26,825	350,613	36,232
1981	25,871	254,799	36,119
1980	24,453	377,729	30,135
1979	24,520	309,602	33,516
1978	23,919	314,551	33,909
1977	23,923	281,872	27,442
1976	23,670	255,720	24,873
1975	27,506	286,999	18,822
1974	27,662	274,457	20,802
1973	27,839	202,931	21,492
1972	27,812	276,170	12,340
1971	27,903	283,944	8,953
1970	27,890	283,650	9,674
1969	27,622	306,576	11,395
1968	27,585	271,489	11,671
1967	27,402	261,035	9,895
5-year average:			
1977-81	24,537	307,711	32,224
1972-76	26,898	259,255	19,666
1967-71	27,680	281,339	10,318

Source: *Agricultural Statistics for Ontario,* Publication 20 (Toronto: Ontario Ministry of Agriculture and Food).

Table 2.—Number of Standard Apple Trees in Ontario, by Age, 1961, 1966, 1971, 1976, and 1981

Year	Age in years				
	1-7	8-15	16-30	31 & over	Total
			number		
1981	44,648	113,585	167,675	205,136	531,044
1976	71,499	125,636	202,095	206,260	605,490
1971	145,728	112,478	252,020	215,958	726,184
1966	113,386	133,303	327,139	174,964	748,792
1961	124,332	169,694	404,556	132,731	831,313

Source: *1981 Fruit Tree Census*, Part III: Apples (Toronto: Ontario Ministry of Agriculture and Food).

Table 3.—Number of Apple Trees on Size-Controlling Rootstock in Ontario, by Age, 1961, 1966, 1971, 1976, and 1981

Year	Age in years				
	1-5	6-10	11-16	17 & over	Total
			number		
1981	994,093	600,771	434,943	190,543	2,220,350
1976	634,993	350,765	178,646	89,812	1,254,216
1971	440,147	200,486	100,242	13,385	754,260
1966	247,624	147,029	31,983	-[a]	426,636
1961	188,364	84,255	-[b]	-[b]	272,619

[a]Included in 11-16 years column.

[b]Included in 6-10 years column.

Source: *1981 Tree Fruit Census*, Part III: Apples (Toronto: Ontario Ministry of Agriculture and Food).

increasing very rapidly while the number of standard trees growing on seedling roots has decreased. From 1971 to 1981, the number of standard apple trees in Ontario dropped from 726,000 to 531,000 (Table 2). During the same period, the number of trees on size-controlling rootstock increased threefold (Table 3).

The percentage of the total apple crop used for processing continued to increase over the three five-year periods since 1967. During the period 1977-1981, there was a dramatic increase in volume of apples used for processing. During this same period, the quantity of apples sold on the fresh market also showed a slight increase over the previous period (Table 4).

Table 4.—Apple Marketings in Ontario, 1967-1981

Year	Fresh market		Processing	
	'000 lb.	%	'000 lb.	%
1981	97,493	38	157,306	62
1980	191,353	51	186,376	49
1979	143,250	46	166,352	54
1978	162,419	52	152,132	48
1977	134,978	48	146,894	52
1976	147,920	58	107,800	42
1975	130,399	45	156,600	55
1974	158,729	58	115,728	42
1973	126,028	62	76,903	38
1972	155,494	56	120,676	44
1971	167,484	59	116,460	41
1970	170,876	60	112,774	40
1969	178,505	58	128,071	42
1968	161,626	60	109,863	40
1967	128,643	49	132,392	51
5-year average:				
1977-81	145,899	47	161,812	53
1972-76	143,714	55	115,541	45
1967-71	161,427	57	119,912	43

Source: *Agricultural Statistics for Ontario* and *The Ontario Apple Marketing Commission.*

ORGANIZATION OF THE STUDY

In the spring of 1982, meetings were held between representatives of the Ontario Apple Marketing Commission and the Economics Branch of the Ontario Ministry of Agriculture and Food. The Economics Branch agreed to conduct a cost of production study on the 1982 apple crop in Ontario with costs being calculated only to the end of harvest. The last cost study on apples was for the 1976 crop and there had been rapid escalation in costs since that time.

The objectives of the study were:

1. To provide management data on different methods of growing apples; and

2. To provide cost data that the Ontario Apple Marketing Commission uses in pricing apples.

The Plant Industry Branch of the Ontario Ministry of Agriculture and Food supplied a list of growers in four regions of the Province. Producers were contacted and those willing to supply the necessary physical and financial data were included in the study. The four apple-growing regions selected for the sample were:

1. Georgian Bay, consisting of farms in Grey and Simcoe Counties;

2. Eastern Ontario, including farms in Prince Edward and Northumberland counties, and the Regional Municipality of Durham;

3. Central Erie, covering Norfolk, Elgin, Middlesex, and Oxford counties; and

4. Essex-Kent.

This report summarizes data from 59 cooperating growers — 31 with size-controlling orchards and 28 with standard orchards. The data presented includes costs to the end of harvest — when the apples have been picked and put in containers and are ready for marketing, or to be taken to the grower's own storage. The cost of trucking, marketing or storage is *not* included.

The data in this report pertains to bearing acreage only. The cost of bringing the apple orchard into production or the value of the existing orchard is not included (the value of the land is included and is discussed later). Costs on the establishment of an apple orchard will be included in a separate report. Although the figures in the report do not necessarily represent the average cost of production for all growers in Ontario, they show the cooperating growers' costs and can be used by other growers in assessing their own costs.

Tables showing the costs of apple production in metric are included in the Appendix.

PROCEDURES USED IN CALCULATING COSTS

Economics Branch fieldmen visited each cooperating grower several times during the study period. Forms were provided to the grower to record all inputs into the apple crop. Data were collected for all operations performed in the orchard and on the crop. Details were obtained on actual costs and quantities of materials and services used, on operator and family labor, on tractors and machines, and on land used.

Since many costs were shared among the different crops grown on a farm, all such costs — both operating and fixed — were allocated proportionately to the apple crop on a per-acre or per-hour basis. The methods used to determine physical inputs and costs are discussed in the following sections.

LABOR

Growers recorded the hours of operator labor and any unpaid family labor used to produce the apple crop. Although this labor was not paid directly, a charge of $6.25 per hour was used in order to evaluate and compare different growers and areas. This is a rate established by the Economics Branch and is slightly higher than the ave_age rate for hired laborers.

The wage rates for hired labor included the cash wages paid, the value of any benefits such as meals given to workers, and payments on the

worker's behalf for Canada Pension Plan, unemployment insurance, and Workmen's Compensation. Airfare for offshore labor and housing at the rate of $17 per week were included where applicable.

TRACTORS AND MACHINES

Where applicable, tractor and machine costs included depreciation, interest on investment, repairs, maintenance labor, gas, oil, insurance, and housing. Since some of the equipment was used for other purposes on the farm, the costs were allocated according to estimated total annual use and estimated amount of use on the apple crop.

The depreciated value of the machines was computed by depreciating the purchase price by the declining balance method at the rate of 15 percent for powered machines and 10 percent for other farm machines. Depreciation for the 1982 crop was calculated on the computed value of the machines at the beginning of 1982. No depreciation was charged on obsolete machinery.

For all equipment not fully depreciated, interest was calculated on the depreciated value. For equipment fully depreciated, the interest charge was calculated on the present value as established.

The interest charge was calculated on the equity in the machinery investment. The equity portion of investment in machinery was assumed to be 70 percent, and the debt portion was 30 percent. The rate used on the debt portion was 17.43 percent, consisting of the average prime rate for 1982 plus 1.5 percent. The rate used on the equity portion was 11.67 percent, the average rate paid by chartered banks on savings accounts for 1982.

Insurance and housing (storage) for farm machines was based on a percentage of the machine's purchase cost. The rate was 0.5 percent for insurance and 1.5 percent for machine housing or storage.

Since few growers can supply accurate information about the repair costs associated with each machine, per-hour rates were established using the factsheet *Cost of Owning and Operating Farm Machines,* Agdex 825, Ontario Ministry of Agriculture and Food. For tractors and machines that were fully depreciated, hourly rates were calculated by determining the approximate cost of a replacement tractor or machine of similar size and capacity.

Fuel consumption was determined for all motorized equipment after discussion with the cooperating grower. A standard cost of 34.2 cents per litre for gasoline and 33.2 cents per litre for diesel fuel was used to compute fuel cost. The hourly cost for oil, grease, and filters was calculated at 15 percent of the hourly fuel cost.

MATERIALS

Growers provided data on the quantities and costs of fertilizers, sprays, mouse bait used, and on the rental of bees. Also included under materials is the cost for soil samples and leaf analysis.

LAND

Land costs included taxes and interest on investment for land used in producing apples. The amounts for nontax items such as tile drainage loan charges and for the Ontario Farm Tax Rebate were deducted from the total tax bill to arrive at the net taxes paid. Tile drainage loan charges were deducted because tile drainage affected the value of land and therefore there would be double accounting. Net taxes were allocated to the apple crop according to the acreage of land used for apples relative to the acreage of the total land on the farm.

In this study, no value has been added for the orchard itself. Since the orchards were of different rootstocks, different ages, and in different condition, it was impossible to arrive at a value for trees and therefore no charge was made.

In any study of the economics of crop production, a difficult and controversial aspect is to determine a cost for the use of land.[1] During the past two decades, purchasers of farmland have generally been willing to pay considerably more than can be justified by capitalizing the net return from agricultural production. The most important reason is that land has been considered to be a good hedge against inflation. Purchasers believe that the speculative aspect of owning land offers benefits over and above those received from crop production. For this reason it would be incorrect to charge the crop grown in a particular year with the full interest cost of carrying the land investment. In this study, interest on land investment is calculated as follows:

1. Land is valued on the basis of recent sales of bare land in the immediate area of cooperating farms; and

2. The interest rate applied is the current lending rate discounted for the rate of inflation, resulting in a rate of 6.5 percent.

Experience shows that this method results in an annual land use charge that corresponds closely with rental rates paid by farmers to landowners. The rental rates are a charge for the land only, and do not contain any speculative element.

ONTARIO APPLE MARKETING COMMISSION FEES

Fees paid to the Ontario Apple Marketing Commission were obtained from the grower. In some cases, the average does not equal the assessed $25 per acre since some orchards were too young and there is a 2.5-acre exemption.

INSURANCE

Liability and crop insurance were included at the cost to the grower. Liability insurance was prorated according to the crops grown on the farm.

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[1] Gordon Framst, *A Method for Determining Enterprise Land Costs* (Toronto: Economics Branch, Ontario Ministry of Agriculture and Food, 1981).

INTEREST ON OPERATING CAPITAL

Operating capital included hired labor, crop insurance, materials, Ontario Apple Marketing Commission fees, fuel and repairs for farm machines. The need for operating capital begins in late winter or early spring and continues until the grower is able to market his crop during the fall, winter, and spring of the following year.

No attempt was made to find out the actual interest rate charged by chartered banks and other lending institutions for the capital that the growers borrowed during the year to pay for the costs of apple production. In order to treat all cooperators the same, it was decided that the charge for interest on operating capital would be 17.43 percent — average prime rate for 1982 plus 1.5 percent. Chargeable items were divided into three groups approximating the time operating funds would be needed:

1. Nine months — hired labor for pruning and crop insurance;
2. Four months — other preharvest labor, materials, fuel and repairs for machinery, and Ontario Apple Marketing Commission fees; and
3. One month — hired labor for harvesting.

YIELDS

Since the cost study was completed at the end of harvest, many growers had not sold their crop and therefore exact yields were not available. In these cases, an estimate was made of the volume in onfarm storages. For growers who had sold their crop, an exact yield could be determined.

APPLE PRODUCTION COSTS IN ONTARIO

Ontario apples are grown by two distinct methods:

1. From trees on seedling rootstocks — a standard orchard; and
2. From trees on size-controlling rootstock.

Some growers use size-controlling rootstock but plant their trees farther apart than usual for this type of tree. Orchards with fewer than 80 trees per acre were classified as standard even though the trees might be on size-controlling rootstock.

STANDARD TREES

The sample included 28 growers with orchards of standard trees: 10 growers in the Georgian Bay area, 7 in Central Erie, and 11 in Eastern Ontario. Average yield for all growers on the study was 394 bushels per acre with the highest yield being 444 bushels in Central Erie. Overall, growers in Central Erie had the most efficient workers as they had the highest yield and the lowest labor hours (Table 5).

Table 5.—Apple Production Costs[a] for Standard Trees, by Region of Ontario, 1982

Item	All records	Georgian Bay	Central Erie	Eastern Ontario
No. of farms	28	10	7	11
Apple ac. studied per farm	37.0	44.8	31.4	33.4
Per acre:				
Yield, bu.	394	374	444	388
Labor hr.	133.9	133.5	116.9	144.6
COSTS				
Labor:		dollars per acre		
Hired	582.34	608.23	543.71	573.89
Operator	131.23	110.75	108.41	169.87
Total	713.57	718.98	652.12	743.76
Tractors	75.94	78.51	107.11	54.14
Machinery	86.60	96.31	105.03	63.72
Bin use	75.64	80.07	80.51	67.34
Materials	233.28	226.06	231.08	243.41
Land use	84.70	53.96	141.73	88.03
OAMC fees	23.16	22.31	23.94	23.73
Crop & liability insurance	34.78	17.70	42.75	50.83
Interest on oprtg. capital	49.41	48.33	47.13	52.08
Miscellaneous	.96	2.23	-	-
Total:				
Per acre	1,378.04	1,344.46	1,431.40	1,387.04
Per bushel	3.50	3.59	3.22	3.57

[a]Costs are to the end of harvest and do not include marketing or storage charges.

TOTAL PRODUCTION COSTS

The study was continued only to the end of harvest, therefore total production costs do not include charges for marketing or storage. The average total production cost was $1,378 per acre and was similar in the different areas with only a 6 percent difference between the high and low regions.

Although total production costs were similar, several differences appeared in the components of these costs between regions. Crop and liability insurance varied from a low of $17.70 per acre in Georgian Bay where only 3 of the 10 cooperators carried crop insurance, to a high of $50.83 an acre in Eastern Ontario. The charge for land also showed a large difference between areas, averaging $54 an acre in Georgian Bay and $142 an acre in Central Erie. The value of land in Central Erie is influenced by the tobacco crop and hence the higher charge in that area. Since the cost of components considered in operating capital is similar in the three areas, the charge for interest on operating capital is also similar.

Table 6.—Preharvest Costs of Apple Production for Standard Trees, by Region of Ontario, 1982

Item	All records	Georgian Bay	Central Erie	Eastern Ontario
No. of farms	28	10	7	11
Apple ac. studied per farm	37.0	44.8	31.4	33.4
Per acre:				
Yield, bu.	394	374	444	388
Labor hr.	33.2	31.3	33.4	35.5
PREHARVEST COSTS		dollars per acre		
Labor:				
Hired	95.22	90.09	130.49	80.34
Operator	79.74	74.32	62.24	96.82
Total	174.96	164.41	192.73	177.16
Tractors	48.54	54.94	55.98	36.27
Machinery	75.65	90.62	72.55	59.26
Materials:				
Fertilizer	24.60	32.32	25.55	14.62
Sprays	200.69	186.78	196.51	220.16
Mouse bait	4.13	4.21	3.97	4.14
Bees	3.41	2.22	4.94	3.94
Miscellaneous	.45	.53	.11	.55
Total	233.28	226.06	231.08	243.41
Miscellaneous	.96	2.23	-	-
Total:				
Per acre	533.39	538.26	552.34	516.10
Per bushel	1.35	1.44	1.24	1.33

PREHARVEST COSTS

Preharvest operations include pruning, spraying, fertilizing, and mowing grass. Total preharvest costs per acre were similar for the three areas and averaged $533 (Table 6). Preharvest labor costs were highest in Central Erie, especially the cost of hired labor. Much of the pruning in Central Erie was done by *offshore labor,* whose gross rate of pay is higher than the wage paid to local hired labor that was predominant for pruning in the other areas. Growers in Eastern Ontario, in general, had older and less expensive tractors and machines, and thus the cost for these items was much lower.

Cost of spray materials was highest in Eastern Ontario, while Georgian Bay growers had the highest costs for fertilizer. Total cost of materials was similar in the three areas and averaged $233 an acre for all standard growers.

HARVESTING COSTS

Growers in the Central Erie region had the highest yields and also had the lowest labor hours and costs per acre (Table 7). Charges for

Table 7.—Harvesting Costs of Apple Production for Standard Trees, by Region of Ontario, 1982

Item	All records	Georgian Bay	Central Erie	Eastern Ontario
No. of farms	28	10	7	11
Apple ac. studied per farm	37.0	44.8	31.4	33.4
Per acre:				
Yield, bu.	394	374	444	388
Labor hr.	100.7	102.2	83.5	109.1
HARVESTING COSTS				
Labor:		dollars per acre		
Hired	487.12	518.14	413.22	493.55
Operator	51.49	36.43	46.17	73.05
Total	538.61	554.57	459.39	566.60
Tractors	27.40	23.57	51.13	17.87
Machinery	11.01	5.84	32.48	4.46
Bin use	75.64	80.07	80.51	67.34
Total:				
Per acre	652.66	664.05	623.51	656.27
Per bushel	1.66	1.77	1.40	1.69

tractor and machinery use were three to four times higher in the Central Erie region compared to the other two areas. Growers in Central Erie spent a significantly higher amount of time using machinery during harvest than did growers in the other areas. Eastern Ontario had the lowest cost for use of bins while Central Erie and Georgian Bay had similar costs despite a difference of 70 bushels per acre in yield.

Total harvesting cost per acre was lowest in the Central Erie region although the differences among the three areas were not large. However, on a per-bushel basis, growers in Central Erie had a significantly lower unit cost because of the higher yields in that region.

SIZE-CONTROLLING TREES

TOTAL PRODUCTION COSTS

A total of 31 growers contributed financial data for analysis of apple production costs on size-controlling trees. Yields averaged 466 bushels per acre for the 31 growers but showed a large difference between areas. Growers in the Essex-Kent area averaged 625 bushels per acre while the cooperators in the Georgian Bay area had the lowest yields, 323 bushels per acre (Table 8).

Labor hours per acre also showed a large range—from under 100 in Central Erie to over 195 in Essex-Kent. As with standard growers, the Central Erie region had the most efficient labor use.

Table 8.—Apple Production Costs[a] for Size-Controlling Trees, by Region of Ontario, 1982

Item	All records	Georgian Bay	Central Erie	Eastern Ontario	Essex -Kent
No. of farms	31	5	9	10	7
Apple ac. per farm	31.3	32.4	36.9	25.0	32.4
Per acre:					
Yield, bu.	466	323	463	419	625
Labor hr.	140.0	130.0	99.5	150.3	195.3
COSTS					
Labor:			dollars per acre		
Hired	611.50	635.57	461.47	712.32	702.87
Operator	122.97	106.35	117.81	117.27	148.61
Total	734.47	741.92	579.28	829.59	851.48
Tractors	83.83	82.78	73.47	74.24	110.27
Machinery	83.89	113.24	82.51	68.01	82.45
Bin use	115.34	89.67	79.22	119.86	181.45
Materials	293.90	262.19	240.12	320.42	353.21
Land use	134.07	48.92	140.30	93.56	230.17
OAMC fees	23.59	22.81	24.20	23.77	23.07
Crop & liab. ins.	45.80	-	43.91	16.82	113.06
Int. oprtg. capital	56.61	56.72	38.72	57.79	81.38
Miscellaneous	.38	1.62	-	.08	.39
Total:					
Per acre	1,571.88	1,419.87	1,301.73	1,604.14	2,026.93
Per bushel	3.37	4.40	2.81	3.83	3.24

[a]Costs are to the end of harvest and do not include marketing or storage charges.

Total costs, not including marketing or storage charges, ranged from $1,302 per acre in Central Erie to $2,027 in Essex-Kent. Despite the highest per-acre cost, Essex-Kent had the second lowest per-bushel cost as they had the highest yield. Per-bushel costs ranged from $2.81 to $4.40 and averaged $3.37.

Some components of the total production costs also showed large variations between areas. The charge for land use ranged from $49 per acre in Georgian Bay to $230 per acre in Essex-Kent. Urbanization and competition for agricultural land were the main reasons for higher land values in the Essex-Kent and Central Erie regions.

Growers in Georgian Bay used no crop insurance for their apples, while Essex-Kent growers paid $113 per acre. Interest on operating capital also was quite variable between areas, but this was because of the variation in costs that comprised the operating capital.

Table 9.—Preharvest Costs of Apple Production for Size-Controlling Trees, by Region of Ontario, 1982

Item	All records	Georgian Bay	Central Erie	Eastern Ontario	Essex -Kent
No. of farms	31	5	9	10	7
Apple ac. per farm	31.3	32.4	36.9	25.0	32.4
Per acre:					
Yield, bu.	466	323	463	419	625
Labor hr.	48.7	47.9	32.4	44.5	78.2
PREHARVEST COSTS		dollars per acre			
Labor:					
Hired	180.57	199.53	112.99	176.50	270.34
Operator	73.00	62.21	82.79	66.52	73.51
Total	253.57	261.74	195.78	243.02	343.85
Tractors	53.69	57.15	51.22	44.09	65.39
Machinery	68.80	91.71	70.60	61.21	58.18
Materials:					
Fertilizer	38.84	52.20	34.04	33.46	42.25
Sprays	241.11	200.58	190.25	273.98	295.43
Mouse bait	6.68	3.93	9.63	7.24	3.73
Bees	6.64	4.89	5.81	5.39	10.48
Miscellaneous	.63	.59	.39	.35	1.32
Total	293.90	262.19	240.12	320.42	353.21
Miscellaneous	.04	.14	-	.08	-
Total:					
Per acre	670.00	672.93	557.72	668.82	820.63
Per bushel	1.44	2.08	1.20	1.59	1.31

PREHARVEST COSTS

The costs of preharvest operations ranged from $558 per acre in Central Erie to $821 per acre in Essex-Kent. Labor costs also showed a large range with the Essex-Kent area using the most labor and therefore having the highest costs (Table 9).

Growers in Eastern Ontario and Essex-Kent spent the most money for materials for their apple crops, mainly because their spray programs were more costly than the other areas. Fertilizer use was the highest in Georgian Bay and lowest in Eastern Ontario. The Georgian Bay cost for fertilizer was influenced by one grower who was renovating an orchard and had extremely high costs. Growers in Essex-Kent spent twice as much as the other areas for bee rental for pollination purposes, while Central Erie growers had the highest costs for mouse bait.

Machinery and tractor costs were highest in Georgian Bay and lowest in Eastern Ontario.

Table 10.—Harvesting Costs of Apple Production for Size-Controlling Trees, by Region of Ontario, 1982

Item	All records	Georgian Bay	Central Erie	Eastern Ontario	Essex -Kent
No. of farms	31	5	9	10	7
Apple acres per farm	31.3	32.4	36.9	25.0	32.4
Per acre:					
Yield, bu.	466	323	463	419	625
Labor hr.	91.3	82.1	67.1	105.8	117.1
HARVESTING COSTS					
Labor:		dollars per acre			
Hired	430.93	436.04	348.48	535.82	432.53
Operator	49.97	44.14	35.02	50.75	75.10
Total	480.90	480.18	383.50	586.57	507.63
Tractors	30.14	25.63	22.25	30.15	44.88
Machinery	15.09	21.53	11.91	6.80	24.27
Bin use	115.34	89.67	79.22	119.86	181.45
Miscellaneous	.34	1.48	-	-	.39
Total:					
Per acre	641.81	618.49	496.88	743.38	758.62
Per bushel	1.38	1.92	1.07	1.77	1.21

HARVESTING COSTS

Harvesting costs differed significantly between regions but the differences were not directly related to the range in yields. Although Essex-Kent had the highest yield, it did not have the lowest cost per bushel to harvest the crop. The highest harvesting cost per bushel was in Georgian Bay which had the lowest yields. Tractor, machinery, and bin use were all highest in the area with the highest yield (Table 10).

COMPARISON OF 1976 AND 1982 APPLE PRODUCTION COSTS

It is interesting to compare changes in the cost of producing a commodity over a period of time. A similar cost study on apples was conducted in 1976. In fact, many of the cooperators in the samples were the same for both studies. It was necessary to adjust the 1976 data to include costs only to the end of harvesting as this was all that was included in the 1982 study. As well, the charge for land use was eliminated from the comparison as a different basis was used for its determination.

Table 11.—Apple Production Costs[a] for Standard Trees, Ontario, 1976 and 1982

Item	1976	1982
No. of farms	36	28
Apple ac. studied per farm	32.9	37.0
Per acre:		
Yield, bu.	411	394
Labor hr.	155.7	133.9
COSTS	dollars per acre	
Labor:		
Hired	445.42	582.34
Operator	80.76	131.23
Total	526.18	713.57
Tractors	58.60	75.94
Machinery, equipment & bins	95.28	162.24
Materials:		
Fertilizer	17.08	24.60
Sprays	98.67	200.69
Mouse bait	1.89	4.13
Miscellaneous	1.44	3.86
Total	119.08	233.28
OAMC fees	9.16	23.16
Crop & liability insurance	10.30	34.78
Interest on operating capital	52.76	49.41
Miscellaneous	2.83	.96
Total:		
Per acre	874.19	1,293.34
Per bushel	2.13	3.28

[a]Costs are to the end of harvest and do not include marketing, storage charges, or land costs.

STANDARD TREES

Total production costs for apples on standard trees increased 48 percent per acre from $874 in 1976 to $1,293 in 1982. Over this same period of time, the Statistics Canada index for overall cost of agricultural inputs rose 95 percent (Table 11).

The cost of materials showed a significant increase, rising 96 percent from $119 per acre in 1976 to $233 per acre in 1982. Spray costs were the largest component of material costs.

Growers had a 14 percent decrease in labor hours between studies but the cost of the labor still rose 36 percent. Tractor costs went up by 30 percent while costs for other machinery and bin use rose 70 percent, mainly because of increased costs of bins.

Table 12.—Apple Production Costs[a] for Size-Controlling Trees, Ontario, 1976 and 1982

Item	1976	1982
No. of farms	22	31
Apple acreage studied per farm	27.3	31.3
Per acre:		
Yield, bu.	376	466
Labor hr.	117.0	140.0
COSTS		
Labor:	dollars per acre	
Hired	348.12	611.50
Operator	74.55	122.97
Total	422.67	734.47
Tractors	51.69	83.83
Machinery, equipment & bins	104.45	199.23
Materials:		
Fertilizer	26.85	38.84
Sprays	113.50	241.11
Mouse bait	3.52	6.68
Miscellaneous	1.13	7.27
Total	145.00	293.90
OAMC fees	8.72	23.59
Crop & liability insurance	23.96	45.80
Interest on operating capital	46.94	56.61
Miscellaneous	4.76	.38
Total:		
Per acre	808.19	1,437.81
Per bushel	2.15	3.09

[a]Costs are to the end of harvest and do not include marketing, storage charges, or land costs.

The cost of crop and liability insurance rose over threefold from 1976, but this includes an increase in coverage by most growers that participated in the insurance plan.

Yield per acre dropped by only 4 percent between studies, but the cost per bushel of growing apples jumped by 54 percent.

SIZE-CONTROLLING TREES

On a per-acre basis, the costs of producing apples on size-controlling trees rose by 78 percent between 1976 and 1982. However, due to a 24 percent increase in yields, the cost per bushel went up by only 44 percent (Table 12). These increases again can be compared to the general increase in agricultural inputs of 95 percent during the same period.

Labor costs showed the largest dollar increase, rising $312 per acre, or 74 percent, from 1976 to 1982. Part of this increase in cost can be attributed to the significant yield increase.

The cost of materials more than doubled between studies with spray material again having the most influence.

The increase in costs for tractor and machine use, and for bin use is somewhat greater for size-controlling trees compared to standard trees, but this difference can mainly be attributed to the increased yield.

Premiums for crop and liability insurance also showed a considerable increase, again partly because of the growers' increased coverage.

APPENDIX

Appendix Table 1.—Apple Area, Production, and Farm Value in Ontario, 1967-1982

Year	Hectares	Marketed production	Farm value
	no.	tonnes	$'000
1982	10,855	159,037	36,232
1981	10,470	115,577	36,119
1980	9,896	171,338	30,135
1979	9,923	140,435	33,516
1978	9,680	142,680	33,909
1977	9,682	127,857	27,442
1976	9,579	115,995	24,873
1975	11,132	130,183	18,822
1974	11,195	124,494	20,802
1973	11,266	92,050	21,492
1972	11,256	125,271	12,340
1971	11,292	128,797	8,953
1970	11,287	128,663	9,674
1969	11,179	139,063	11,395
1968	11,164	123,147	11,671
1967	11,090	118,405	9,895
5-year average:			
1977-81	9,930	139,578	32,224
1972-76	10,886	117,598	19,666
1967-71	11,202	127,615	10,318

Source: *Agricultural Statistics for Ontario,* Publication 20 (Toronto: Ontario Ministry of Agriculture and Food).

Appendix Table 2.—Apple Marketings in Ontario, 1967-1981

Year	Fresh market		Processing	
	tonnes	%	tonnes	%
1981	44,223	38	71,354	62
1980	86,798	51	84,540	49
1979	64,978	46	75,457	54
1978	73,673	52	69,007	48
1977	61,226	48	66,631	52
1976	67,097	58	48,898	42
1975	59,149	45	71,034	55
1974	72,000	58	52,494	42
1973	57,167	62	34,883	38
1972	70,532	56	54,739	44
1971	75,971	59	52,826	41
1970	77,509	60	51,154	40
1969	80,970	58	58,093	42
1968	73,313	60	49,834	40
1967	58,352	49	60,053	51
5-year average:				
1977-81	66,180	47	73,398	53
1972-76	65,189	55	52,409	45
1967-71	73,223	57	54,392	43

Source: *Agricultural Statistics for Ontario* and *The Ontario Apple Marketing Commission.*

Appendix Table 3.—Apple Production Costs[a] per Hectare for Standard Trees, by Region of Ontario, 1982

Item	All records	Georgian Bay	Central Erie	Eastern Ontario
No. of farms	28	10	7	11
Hectares studied per farm	15.0	18.1	12.7	13.5
Per hectare:				
Yield, tonnes	18.5	17.6	20.9	18.3
Labor hr.	330.9	329.9	288.9	357.3
COSTS				
Labor:		dollars per hectare		
Hired	1,439.02	1,503.00	1,343.56	1,418.14
Operator	324.28	273.67	267.89	419.77
Total	1,763.30	1,776.67	1,611.45	1,837.91
Tractors	187.66	194.01	264.68	133.79
Machinery	214.00	237.99	259.54	157.46
Bin use	186.91	197.86	198.95	166.40
Materials	576.46	558.62	571.02	601.49
Land use	209.30	133.34	350.23	217.53
OAMC fees	57.23	55.13	59.16	58.64
Crop & liability insurance	85.94	43.74	105.64	125.61
Interest on oprtg. capital	122.10	119.43	116.46	128.69
Miscellaneous	2.37	5.51	-	-
Total:				
Per hectare	3,405.27	3,322.30	3,537.13	3,427.52
Per tonne	184.07	188.77	169.24	187.30

[a]Costs are to the end of harvest and do not include marketing or storage charges.

Appendix Table 4.—Apple Production Costs[a] per Hectare for Size-Controlling Trees, by Region of Ontario, 1982

Item	All records	Georgian Bay	Central Erie	Eastern Ontario	Essex -Kent
No. of farms	31	5	9	10	7
Ha studied per farm ...	12.7	13.1	14.9	10.1	13.1
Per hectare:					
Yield, tonnes	21.9	15.2	21.8	19.7	29.4
Labor hr.	346.0	321.2	245.9	371.4	482.6
COSTS					
Labor:		dollars per hectare			
Hired	1,511.08	1,570.56	1,140.34	1,760.21	1,736.86
Operator	303.87	262.80	291.12	289.79	367.23
Total	1,814.95	1,833.36	1,431.46	2,050.00	2,104.09
Tractors	207.15	204.56	181.55	183.45	272.49
Machinery	207.30	279.83	203.89	168.06	203.74
Bin use	285.02	221.58	195.76	296.19	448.38
Materials	726.26	647.90	593.36	791.79	872.82
Land use	331.30	120.89	346.70	231.20	568.77
OAMC fees	58.30	56.36	59.80	58.74	57.01
Crop & liab. ins.	113.18	-	108.51	41.56	279.38
Int. on oprtg. cap. ...	139.89	140.16	95.68	142.80	201.10
Miscellaneous	.94	4.00	-	.20	.96
Total:					
Per hectare	3,884.27	3,508.64	3,216.71	3,963.99	5,008.74
Per tonne	177.36	230.83	147.56	201.22	170.37

[a]Costs are to the end of harvest and do not include marketing or storage charges.

Appendix Table 5.—Apple Production Costs[a] per Hectare for Standard Trees, Ontario, 1976 and 1982

Item	1976	1982
No. of farms	36	28
Hectares studied per farm	13.3	15.0
Per hectare:		
Yield, tonnes	19.3	18.5
Labor hr.	384.8	330.9
COSTS		
Labor:	dollars per hectare	
Hired	1,100.68	1,439.02
Operator	199.56	324.28
Total	1,300.24	1,763.30
Tractors	144.81	187.66
Machinery, equipment & bins	235.45	400.91
Materials:		
Fertilizer	42.21	60.79
Sprays	243.82	495.92
Mouse bait	4.67	10.21
Miscellaneous	3.56	9.54
Total	294.26	576.46
OAMC fees	22.64	57.23
Crop & liability insurance	25.45	85.94
Interest on operating capital	130.37	122.10
Miscellaneous	6.99	2.37
Total:		
Per hectare	2,160.21	3,195.97
Per tonne	111.93	172.76

[a]Costs are to the end of harvest and do not include marketing, storage charges, or land costs.

Appendix Table 6.—Apple Production Costs[a] per Hectare for Size-Controlling Trees, Ontario, 1976 and 1982

Item	1976	1982
No. of farms	22	31
Hectares studied per farm	11.0	12.7
Per hectare:		
Yield, tonnes	17.7	21.9
Labor hr.	289.1	346.0
COSTS		
Labor:	dollars per hectare	
Hired	860.24	1,511.08
Operator	184.22	303.87
Total	1,044.46	1,814.95
Tractors	127.73	207.15
Machinery, equipment & bins	258.11	492.32
Materials:		
Fertilizer	66.35	95.98
Sprays	280.47	595.81
Mouse bait	8.70	16.51
Miscellaneous	2.79	17.96
Total	358.31	726.26
OAMC fees	21.55	58.30
Crop & liability insurance	59.21	113.18
Interest on operating capital	115.99	139.89
Miscellaneous	11.76	.94
Total:		
Per hectare	1,997.12	3,552.99
Per tonne	112.83	162.24

[a]Costs are to the end of harvest and do not include marketing, storage charges, or land costs.

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